



PATIENT MANUAL

V-Hold is Patent Pending LVHM01 rev 3.0





WHAT IS V-HOLD?

V-Hold is a microprocessor vacuum locking suction suspension system that provides an active positive vacuum to secure a transtibial prosthesis for optimum fit, comfort and confidence.

V-Hold provides clinical real time digital feedback and analysis to monitor socket fit and function.

The V-Hold microprocessor monitors the vacuum signature within the socket and makes continuous ongoing real time adjustments to the suction suspension to accommodate changes in activity, walking speed, terrain, and even barometric pressure.

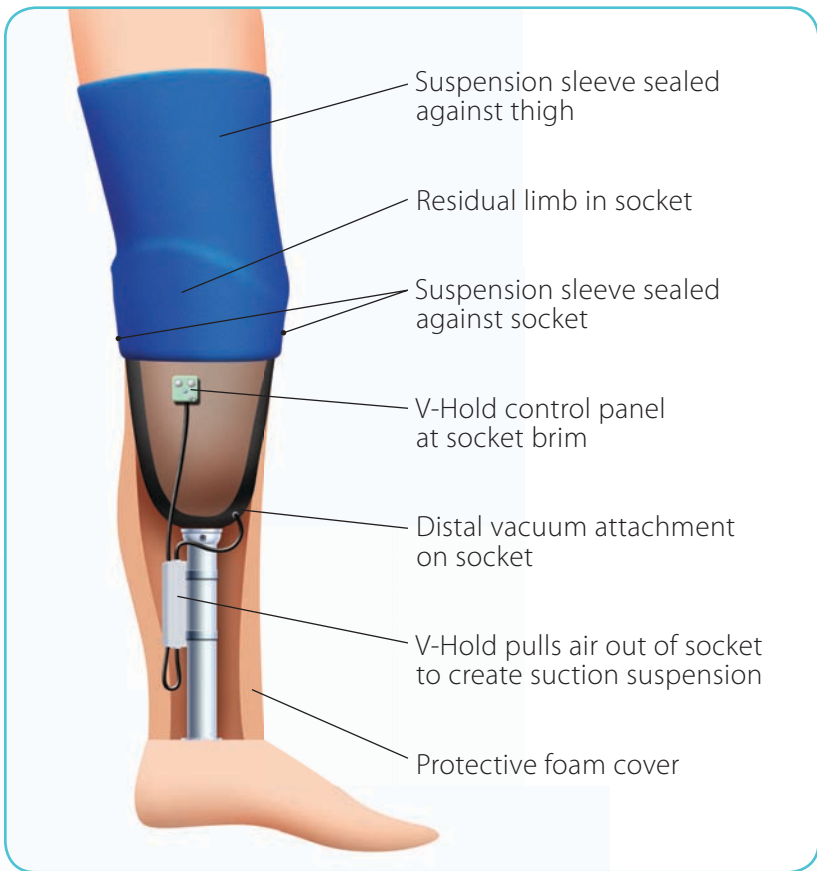
V-HOLD PATIENT FEATURES AND BENEFITS

The active positive vacuum provided by V-Hold:

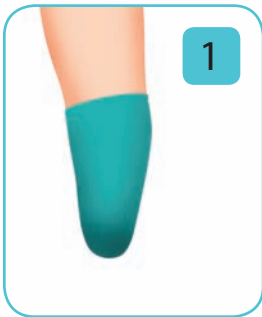
- Enhances socket comfort by securing total contact to reduce skin abrasion on the residual limb
- Improves patient confidence by providing optimum suspension
- Provides quality suspension vacuum to maintain uniform residual limb volume throughout the day
- Provides optimum patient proprioception within the socket for better balance, stability and control

POSITIVE SUCTION SUSPENSION

Positive Suction Suspension provides a secure bond between the residual limb and the prosthesis. This is accomplished by positioning the residual limb in the prosthetic socket, and then creating a sealed vacuum chamber between the upper thigh and the end of the prosthetic socket. The distal end of the socket is secured to the V-Hold microprocessor pump, which pulls the appropriate amount of air out of the end of the socket. This creates a vacuum pressure within the socket to provide optimum suction suspension.



PROSTHETIC DONNING PROCEDURE



1. Position the internal silicone liner onto the residual limb. Pull the appropriate number of socks over the liner.



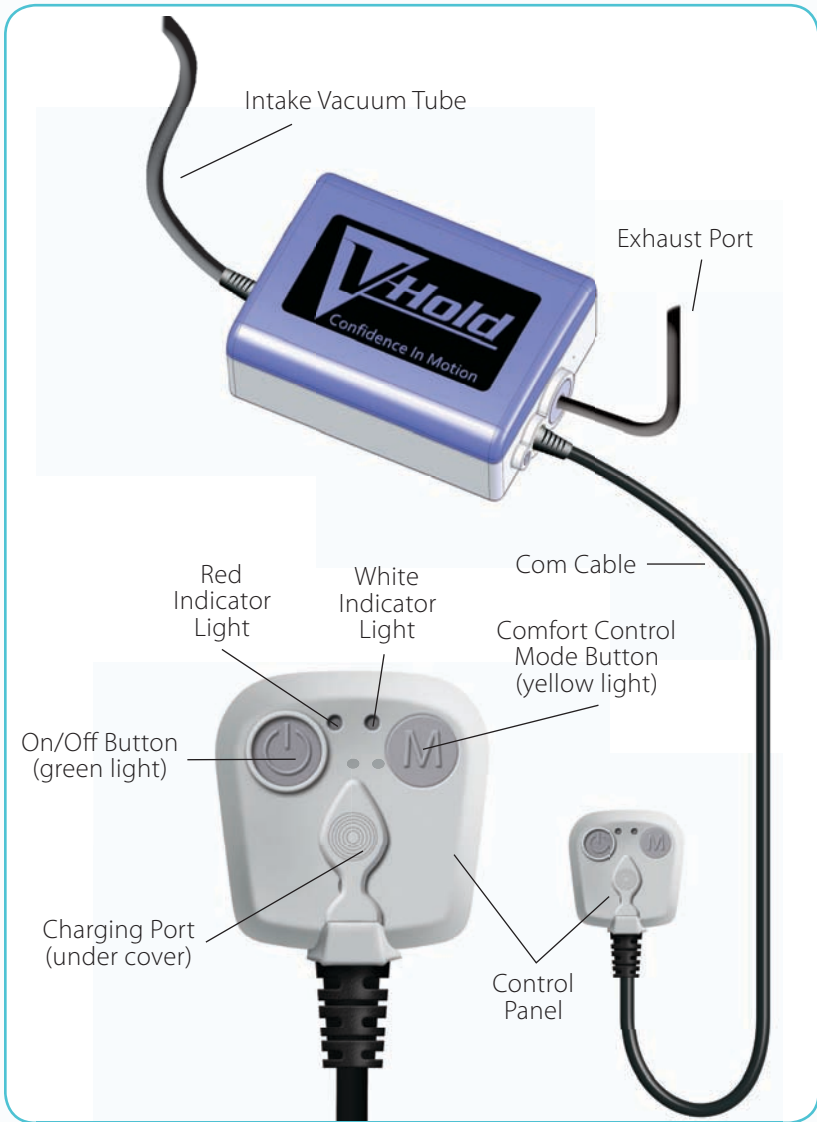
2. Position the residual limb and liner into the socket.



3/4. Pull the suspension sleeve up over the socket and up onto the thigh to ensure an airtight seal between the thigh and sleeve. Then turn on the V-Hold.



V-HOLD COMPONENTS





TURN ON THE V-HOLD

Press the On/Off button for 1 second to turn the unit on. All 4 LED lights will blink once and the pump will vibrate once. After a second, the V-Hold will initiate and secure the socket suspension settings for Activities of Daily Living (ADL settings) as programmed by your clinical specialist.

The green light under the On/Off button will blink every 2.5 seconds to indicate that the V-Hold is on.

TURN OFF THE V-HOLD

Press the On/Off button for 2 seconds. All 4 LED lights will blink quickly 3 times and the pump will vibrate quickly 3 times.



COMFORT CONTROL

The clinician will program the V-Hold to provide optimum suspension in the prosthesis for Activities of Daily Living.

The V-Hold can be programmed to provide specialized settings to accommodate the individualized or unique needs of each wearer for special activities.

INITIATING COMFORT CONTROL

To change the V-Hold setting to Comfort Control mode, press the M button for one-half second. The V-Hold will vibrate quickly 2 times.

The yellow light under the M button will blink every 2.5 seconds to indicate that the unit is in Comfort Control mode.

EXITING COMFORT CONTROL

To exit Comfort Control mode, press the M button for one-half second. The V-Hold will vibrate 1 time to indicate that the unit is back in ADL mode. The green light under the On/Off button will blink every 2.5 seconds to indicate that the unit has returned to ADL settings.



Your clinical specialist can program the V-Hold to automatically exit Comfort Control mode after an established, agreed upon time period.



PUMP TIME-OUT OR INTERNAL ERROR

If the V-Hold runs for 2 minutes and is not able to bring the suspension vacuum up to the upper vacuum setting (UVS), this is an indication that there may be a leak in the suspension sleeve as the V-Hold cannot secure the required vacuum level. This event will cause the V-Hold to vibrate quickly 3 times, and then the V-Hold pump will turn off. The red light will come on and the green light will blink to indicate an error code.

The error code on the red and green lights will repeat every 5 seconds and the V-Hold will continue to vibrate 3 times every minute as a reminder that there is an issue with the suspension that needs to be addressed.

To reset the V-Hold, inspect the suspension sleeve to secure a proper seal between the thigh and socket and press the On/Off button to turn the V-Hold on.

LOW BATTERY CONDITION

GREEN SYSTEM LED AND YELLOW COMFORT CONTROL LED OPERATION

When the V-Hold is on, the light under either the On/Off button or the M button will blink to indicate the amount of charge left in the battery.

LOW BATTERY WARNING	REMAINING BATTERY CHARGE
1 blink	Over 66%
2 blinks	Between 33% and 66%
3 blinks plus vibration warning	Less than 33%

When the V-Hold battery gets to 33% of a charge, the V-Hold will vibrate 5 times to let you know that the battery needs to be recharged. When the battery level reaches a critical level, the V-Hold will vibrate 10 times and then turn off.

BATTERY CHARGING

When the charger is plugged in, the white light will blink to indicate that the unit is charging the battery.

NO. OF BLINKS EVERY 2.5 SECONDS	BATTERY CHARGE LEVEL
3	33% or less
2	Between 33% and 66%
1	Over 66%
Solid, steady light	100%

Note: Please charge the battery for 3 or more hours before first use. If the charging light continues to blink after 8 hours of charging contact your practitioner.



V-HOLD ADJUSTMENTS

The V-Hold will provide a vacuum suspension and can be adjusted and modified to each person's individual needs and preferences.

No prosthesis can maintain a perfect suction vacuum chamber in the socket; therefore, all prosthetic sockets will slowly leak air during normal wearing. This is beneficial as it allows the skin on the residual limb to "breathe" and also varies the vacuum levels in the socket during the day. This enhances comfort and assists in supporting proper blood circulation in the residual limb.

The maximum vacuum setting is 100. It is very important to note that higher vacuum does not relate to better suspension. In many instances, too much vacuum will create socket discomfort and actually reduce the quality of the suspension.

The minimum setting is 0, which is no vacuum.

The V-Hold is programmed by the prosthetist to establish the optimum maximum and minimum settings for each patient's needs and comfort.

During the fitting process, the prosthetist will establish the optimum minimum vacuum setting to suspend the prosthesis. When the vacuum within the socket meets this level, the V-Hold will automatically turn on and pull air out of the socket to create a suction suspension.

The practitioner will also set the optimum maximum vacuum setting for the suspension. Once the V-Hold pulls the air out of the socket to achieve the preset optimum maximum setting, the V-Hold will automatically turn off.

V-HOLD TECHNICAL TERMS

REAL TIME VACUUM SETTING (RTV)

- The actual vacuum setting within the socket, measured on a scale of 0-100

UPPER VACUUM SETTING (UVS)

- The upper vacuum setting of the V-Hold
- The pump will stop pulling vacuum when the RTV equals this setting

LOWER VACUUM SETTING (LVS)

- The lower vacuum setting of the V-Hold
- The pump will initiate when the RTV equals this setting

VACUUM DRAFT

- The difference between the UVS and the LVS
- If the UVS is set at 60 and the LVS is set at 20, the vacuum draft will be 40

VACUUM SIGNATURE

- The unique variations and fluctuations of the vacuum readings within the socket
- Vacuum signature will be affected by socket fit, alignment and activity level

RUN TIME

- The length of time the V-Hold pump runs
- The time in seconds between UVS and LVS

VACUUM TIME

- The length of time the V-Hold pump is not running
- The time in minutes between UVS and LVS



V-HOLD TROUBLESHOOTING

PUMP WILL NOT TURN ON

- Check that the power cord is properly plugged into a wall outlet and the V-Hold. The white charging light will blink while charging and then stay fully illuminated once charging is complete.

PUMP TURNS OFF AUTOMATICALLY

- This is caused by a pump time-out or run-time error. If the V-Hold runs for 2 minutes and is not able to bring the suspension vacuum up to the UVS, the V-Hold will turn off and the red and green lights will blink every 5 seconds.
- This situation is most likely caused by a leak in the socket suspension system.
- Replace the suspension sleeve, and ensure the suspension sleeve is properly sealed against the skin on the thigh and the socket.
- Press the On/Off button to reset the V-Hold and turn it back on.

PUMP RUNS, BUT WILL NOT PULL VACUUM

- This condition is most likely caused by a foreign object blocking the flow of air into the V-Hold.
- Closely inspect the distal end of the socket to remove any dirt or fibers from the inside of the socket, focusing on the distal air valve inside the socket.

V-HOLD OPERATION SUMMARY

NO. OF V-HOLD VIBRATIONS	LIGHTS BLINKING	V-HOLD STATUS
1	Green light	Turning on to ADL mode
2	Yellow light	Entering Comfort Control mode
3	All lights blink once and then turn off	Turned off
3	Red light on, green light blinks	V-Hold experienced run-time error, V-Hold has turned off
5	Green or yellow light blinks 3 times every 2.5 seconds	Battery at 33%
10	All lights off	Battery level critical, V-Hold turning off

Should the recommended troubleshooting options not solve the issue, please contact your prosthetist immediately.

DO

- Read and follow all instructions
- Provide a cosmetic cover to protect the V-Hold (*this will also muffle the sound made by the pump*)
- Keep vacuum lines as short as possible
- Remove the prosthesis before recharging
- Recharge the V-Hold every night
- Use the V-Hold only for a transtibial prosthesis

DO NOT

- Get the V-Hold wet
- Take the V-Hold apart
- Pull or run liquid into the V-Hold
- Recharge the V-Hold while wearing the prosthesis
- Hit or strike the V-Hold with sharp or hard objects

V-HOLD TECHNICAL FEATURES

- On-board microprocessor monitors and controls socket vacuum in real time.
- High capacity miniaturized pump will secure vacuum in a total contact surface-bearing transtibial socket in less than one second.
- Whisper pump technology provides for a quiet, maintenance-free system.
- V-Hold has a rechargeable lithium-ion battery; average run time of a full charge is 36-40 hours.
- System adjusts for changes in elevation and barometric pressure to maintain constant and uniform suction.
- Comfort Control allows the patient to manually initiate customized vacuum settings to accommodate the individual or unique needs of each wearer, to enhance comfort and suspension.
- V-Hold adjusts for changes in the patient's activity levels to initiate vacuum to maintain optimum and consistent positive suction.
- Microprocessor is programmed in real time, with the patient wearing the V-Hold, using a computer and Bluetooth® connection.
- Upper and lower vacuum settings can be independently and manually set by the practitioner.
- Provides real time feedback and analysis of the socket vacuum signature during programming.
- Vacuum signature provides insight with regard to socket fit, alignment, suspension and activity-related socket stresses and shear forces.
- This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: 1) this device may not cause harmful interference, and 2) this device must accept any interference received including interference that may cause undesired operation.



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NEUROTRONICS

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